Assessment Schedule – 2020

Agricultural and Horticultural Science: Demonstrate knowledge of horticultural plant management practices and related plant physiology (90924)

Assessment Criteria

Achievement	Achievement with Merit	Achievement with Excellence
Describes horticultural plant management practices and related plant physiology and / or growing conditions.	**Links** ideas to **explain** why horticultural plant management practices, or steps within practices, are carried out.	**Applies knowledge** of horticultural plant management practices to given situations. This may involve **comparing and contrasting** or **justifying** management practices

Evidence

Question ONE	Evidence
(a) Demonstrates knowledge of a shelter belt that could be used in an orchard.	**Describes** (Achievement) • Shelter belts can either be artificial (e.g. wind cloth), or natural (e.g. trees) (Achievement).
(b) Demonstrates knowledge of why a shelter belt is needed, and how it affects plant growth and fruit yield.	**Describes** (Achievement) **/ Explains** (Merit) • Shelter belts reduce the effects of wind (Achievement), reducing the loss of water through evapotranspiration (Merit) and increasing insect activity (Merit). • They reduce air movement (Achievement) so a micro-climate of warm air is created around the plant (Merit), and plant processes are sped up, i.e. faster growth (Merit). They can sometimes create a more humid environment (Merit), which can increase fungal disease (Merit). • Shelter belts reduce movement of the plant (Achievement), ensuring wind is less likely to break the plant or parts of it (Merit), and fruit is less likely to be damaged (Merit). Flowers are less likely to be blown away (Merit).
(c) Demonstrates knowledge of how pheromone traps and insecticides reduce orchard pests.	**Describes** (Achievement) / **Explains** (Merit) / **Justifies** (Excellence) • Pheromone traps are hung in trees around the orchard (Achievement), and chemical sprays are sprayed onto the trees (Achievement). It is a form of integrated pest management (Achievement). • Pheromone traps use a chemical to lure the adult moths into the trap (Achievement). This ensures the grower can see what type of pests are around (Merit) and then spray for that particular pest (Merit). • Using the two methods together means spray is only being used when necessary (Merit), and therefore less chemicals in the environment (Merit). The impact on pest levels is quick because a chemical was used (Merit). • Because the adult is sprayed before mating (Merit), the lifecycle is broken (Merit), eggs are not laid / caterpillars do not hatch (Merit), so there is no damage done to the plant (Merit).

N1	N2	A3	A4	M5	M6	E7	E8
Describes ONE idea at Achievement level.	Describes TWO ideas at Achievement level.	Describes THREE ideas at Achievement level.	Describes FOUR ideas at Achievement level.	Explains THREE ideas at Merit level.	Explains FOUR ideas at Merit level.	Justifies the use of TWO methods to control pests and improve plant production. ONE practice is well covered, with minimal information given for the other.	Fully justifies the TWO methods to control pests and improve plant production by linking together the use of BOTH practices.

<table>
<tr><th>Question TWO</th><th>Evidence</th></tr>
<tr><td>(a) Demonstrates knowledge of how and why seeds are sown into containers.</td><td colspan="2">Describes (Achievement) / Explains (Merit)
• Fill a container with growing media or potting mix, and level it with a float (Achievement) to ensure it is an even seedbed (Merit).
• Sprinkle or place seeds evenly over the growing media (Achievement); this will ensure they are evenly spaced when they emerge (Merit), and they will not crowd each other, or compete (Merit), or be too difficult to prick out (Merit).
• Cover the seeds with the growing mix one-and-a-half times the depth of the seed size (Achievement) so there is not too much media for the seedling to grow through (Merit). This must be done before the seed runs out of food or energy (Merit).
• Water (Achievement). Water is needed to start germination (Merit).
• Read the back of the seed packet (Achievement) to ensure correct depth sown (Merit), and correct spacing once seedlings emerge (Merit).
• Plant in a warm area (Achievement) to speed up plant processes (Merit).</td></tr>
<tr><td>(b) Demonstrates knowledge of hardening off and how it improves plant production.</td><td colspan="2">Describes (Achievement) / Explains (Merit)
• Hardening off is when plants are placed from the glasshouse to an ‘almost’ outside area (Achievement) so the seedling can become slowly acclimatised to its environment (Merit). It is less stressful on the plant and the survival rate is much higher once they are placed outside (Merit). Less plants die once they are planted outside (Merit).</td></tr>
<tr><td>(c) Demonstrates knowledge of the most effective irrigation system for seedlings.</td><td colspan="2">Describes (Achievement) / Explains (Merit) / Justifies (Excellence)
• Water is needed for plant processes such as respiration, photosynthesis, and transpiration, and for cell turgidity.</td></tr>
<tr><td></td><td>Sprinklers
Advantages
• Out of the way of people (Achievement), which means less likely to get damaged by workers (Merit).
• Provides a fine mist (Achievement), which can cool the air (Merit).

Disadvantages
• Water can damage leaves (Achievement), decreasing photosynthesis (Merit).
• Wasteful as more water is lost through evaporation or goes onto areas that it is not needed.
• Greater chance of uneven distribution (Achievement), which can cause areas of uneven growth (Merit).
• More costly to set up.</td><td>Dripline irrigation
Advantages
• Water is applied only where it needs to be, in the root zone (Achievement), so the plant has a consistent amount of water (Merit).
• Water does not get on the leaves or the fruit (Achievement), therefore fruit is not water-damaged, and there is a reduced chance of disease (Merit).

Disadvantages
• More easily damaged by workers (Achievement), increasing repair costs (Merit).
• More difficult to install.</td></tr>
</table>

N1	N2	A3	A4	M5	M6	E7	E8
Describes ONE idea at Achievement level.	Describes TWO ideas at Achievement level.	Describes THREE ideas at Achievement level.	Describes FOUR ideas at Achievement level.	Explains THREE ideas at Merit level.	Explains FOUR ideas at Merit level.	Justifies the chosen method by comparing and contrasting. Supporting practice briefly compared to chosen practice.	Fully justifies the chosen method by comparing and contrasting to the other practice.

N0 = No response; no relevant evidence.

Question THREE	Evidence
(a) Demonstrates knowledge of the difference between macronutrients and micronutrients and how they affect plant processes.	**Describes** (Achievement) / **Explains** (Merit) • Micronutrients are required by the plant in small amounts (Achievement), and macronutrients are required by the plant in larger amounts (Achievement). • Both assist with providing the plant with nutrients to help plant processes and improve growth (Merit). • States a correct nutrient and correctly identifies it as macro / micro (Achievement) and explains the effect on plant production (Merit).
(b) Demonstrates knowledge of the effect carbon dioxide (CO_2) has on plant production and crop yield.	**Describes** (Achievement) / **Explains** (Merit) • Plants require carbon dioxide (Achievement). Carbon dioxide is needed for photosynthesis (Merit). Increasing CO_2 increases the rate of photosynthesis (Merit), which increases plant growth (Merit), and will increase the ripening and size of the tomatoes (Merit). • Photosynthesis occurs in the leaves (Achievement). CO_2 enters through the leaves (Achievement). CO_2 enters through the stomata (Merit). Photosynthesis equation – word or symbol (Achievement) and linked to process of photosynthesis (Merit). *Award credit if further structures are described. Word and / or chemical equation is acceptable.*
(c) Demonstrates knowledge of how staking and disbudding tomato plants improves production.	**Describes** (Achievement) / **Explains** (Merit) / **Justifies** (Excellence) • Disbudding is picking off or cutting off the new bud shoots or growths (Achievement), so that the plant puts more energy into its fruit-producing parts (Merit), which increases fruit / crop yield (Merit). - Disbudding also reduces leaf growth (Merit), as excess leaves can shade lower fruit and delay ripening (Merit). - Removal of the lateral / side buds (Achievement) encourages the plant to put more energy into the terminal bud or remaining buds (Merit), to get fewer but higher-quality fruit (Merit), or to get upward growth (Merit). • Staking is carefully tying the plant to a stake that has been driven into the ground (Achievement). This provides support for the plant (Achievement) and helps the plant grow upright off the ground (Achievement), making it easier to carry out management practices on (Merit). - Increases airflow through the plant (Achievement) to prevent disease and / or pests (Merit), and to improve the quality or quantity of the flowers and fruit (Merit). - It increases light to the centre of the plant (Achievement), improving photosynthesis and reducing the likelihood of fungal or bacterial disease (Merit). Both practices enable light to get to the tomatoes to help with ripening. Tomatoes are within easy reach of people harvesting them, and they are easily seen, so harvesting is easier and means the entire crop will be harvested, thereby increasing the yield.

N1	N2	A3	A4	M5	M6	E7	E8
Describes ONE idea at Achievement level.	Describes TWO ideas at Achievement level.	Describes THREE ideas at Achievement level.	Describes FOUR ideas at Achievement level.	Explains THREE ideas at Merit level.	Explains FOUR ideas at Merit level.	Justifies the use of TWO methods to improve plant production. ONE practice well covered with minimal information given for the other.	Fully justifies the TWO methods used to improve plant production by linking together the use of BOTH practices.

N0 = No response; no relevant evidence.

Cut Scores

Not Achieved	Achievement	Achievement with Merit	Achievement with Excellence
0 – 6	7 – 12	13 – 18	19 – 24